

REMARKS

The Office Action dated November 28, 2007, has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

By this Response, claims 1, 3-5, and 9-21 have been amended to more particularly point out and distinctly claim the subject matter of the present invention. No new matter has been added. Support for the above amendments is provided in the Specification in at least paragraphs [0023] – [0048]. Accordingly, claims 1-21 are currently pending of which claims 1, 12, and 15 are independent claims.

Applicants thank the Examiner for indicating that claims 4 and 19-21 contain allowable subject matter.

In view of the above amendments and the following remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending claim rejections for the reasons discussed below.

Claim Rejections under 35 U.S.C. §103(a)

The Office Action rejected claims 1-3 and 5-18 under 35 U.S.C. §103(a) as allegedly unpatentable as obvious over Tasman, *et al.* (U.S. Patent Publication No. 2002/0080755) (“Tasman”). Applicants respectfully submit that the claims recite subject matter that is neither disclosed nor suggested in Tasman.

Claim 1, upon which claims 2-11 and 19 depend, recites a method. The method includes assembling data units of at least one incoming data stream into an output data stream. The data units are destined for at least one destination node, and the output stream includes a service level requirement for each of the at least one destination node. The method further includes selecting, in response to the assembling, a first set of physical radio transmission resources for the output data stream. The first set of physical radio transmission resources is selected from physical radio transmission resources of one of a plurality of wireless connectivity technologies and belongs to physical radio transmission resources available in a wireless communication device. The wireless communication device is provided with the plurality of wireless connectivity technologies. The method further includes searching for a path that leads from the wireless communication device to one of the at least one destination node and fulfills the service level requirement corresponding to that destination node when one leg of the path is implemented by the first set of physical radio transmission resources. The searching is performed with respect to each of the at least one destination node. The method further includes scheduling a transmission of the output data stream when the path is found for each of the at least one destination node. The scheduling presumes that the transmission is to occur through the first set of physical radio transmission resources.

Claim 12, upon which claims 13-14 and 20 depend, recites a system. The system includes a traffic assembler configured to assemble data units for at least one incoming data stream into an output data stream. The data units are destined for at least one destination

node, and the output stream includes a service level requirement for each of the at least one destination node. The system also includes a resource selector, responsive to the traffic assembler, configured to select a first set of physical radio transmission resources for the output data stream. The first set of physical radio transmission resources is selected from physical radio transmission resources of one of a plurality of wireless connectivity technologies and belongs to physical radio transmission resources currently available in a wireless communication device. The wireless communication device is provided with the plurality of wireless connectivity technologies. The system further includes a router configured to search for a path that leads to one of the at least one destination node and fulfills the service level requirement corresponding to that destination node when one leg of the path is implemented by the first set of physical radio transmission resources. The router is further configured to search for the path for each of the at least one destination node. The system further includes a traffic scheduler configured to schedule a transmission of the output data stream when the path is found for each of the at least one destination node. The transmission is scheduled to occur through the first set of physical radio transmission resources.

Claim 15, upon which claims 16-18 and 21 depend, recites an apparatus. The apparatus includes a traffic assembler configured to assemble data units of at least one incoming data stream into an output data stream. The data units are destined for at least one destination node, and the output data stream includes a service level requirement for each of the at least one destination node. The apparatus also includes a resource selector responsive

to the traffic assembly and configured to select a first set of physical radio transmission resources for the output data stream. The first set of physical radio transmission resources is selected from physical radio transmission resources of one of a plurality of wireless connectivity technologies and belongs to physical radio transmission resources currently available in the apparatus. The apparatus further includes a path detector configured to detect whether a path leading to a destination node and fulfilling the corresponding service level requirement is available for each of the at least one destination node. One leg of the path is implemented by the first set of transmission resources. The path detector is operably connected to a routing entity configured to search for paths leading from the apparatus to the at least one destination node. The apparatus further includes a traffic scheduler, responsive to the path detector configured to schedule a transmission of the output data stream. The traffic scheduler is configured to schedule the transmission to occur through the first set of physical radio transmission resources.

Applicants respectfully submit that certain embodiments of the present invention provide non-obvious advantages. Specifically, certain embodiments of the present invention relate to enabling a multi-mode wireless device to use its physical and radio resources while satisfying quality of service requirements of different end-to-end connections. Thus, certain embodiments provide a technical advantage in that a method and system are provided in which physical radio transmission resources are first selected for an assembled output data stream. Subsequently, a route for each destination node associated with the output data stream is searched for by the

system. For each located route, the selected radio transmission resources are assumed to form the first leg, whereby the route fulfills quality of service requirements for an associated destination node. However, the selection of the resources and the routing are performed tightly together, so that the allocated resources may still be affected if the routing indicates that a re-allocation of the radio transmission resources is necessary. Thus, the wireless device of the invention may optimally utilize its own physical and radio resources while also satisfying quality of service requirements of different connections. The device may perform the transmission by giving priority to its own currently available capabilities, while also fulfilling the quality of service requirements of the connections. This is important in multi-mode devices provided with a plurality of different wireless connectivity technologies, since it is important that such a device can use its physical resources efficiently in order to ensure efficient overall control of data traffic.

As will be discussed below, the Office Action fails to establish a *prima facie* case of obviousness with respect to the features recited in claims 1-3 and 5-18 in view of Tasman, and therefore fails to provide the advantages and the features of the claims discussed above.

Tasman is directed to an architecture and mechanism for forwarding layer interfacing for networks. Specifically, Tasman discloses a communication apparatus in a communications network provided for communication among a plurality of communication apparatuses. The communication apparatus routes messages for

neighboring apparatuses. The network includes a plurality of mobile communication stations, each station being configurable to route message packets for neighboring stations. The mobile communications station includes a transceiver to transmit and receive message packets (Tasman, Abstract; paragraphs [0015] – [0019]).

Applicants respectfully submit that the Office Action fails to establish a *prima facie* case of obviousness with respect to the limitations recited in claim 1 in view of Tasman. Specifically, Tasman fails to disclose or suggest, at least, “assembling data units of at least one incoming data stream into an output data stream, wherein the data units are destined for at least one destination node, and the output stream comprises a service level requirement for each of the at least one destination node” as recited in claim 1.

As noted in the Office Action on page 4, Tasman fails to explicitly disclose assembling data units of at least one incoming data stream into an output stream. The Office Action alleged that it is well known in the art that radio layers (MAC/Modem Layer 10 in Fig. 3b) assemble data units of incoming data streams into at least one output stream without providing any documentary evidence to support its assertion.

The Office appears to be taking “Official Notice.” According to MPEP 2144.03, “the examiner may take official notice of facts outside of the record which are capable of instant and unquestionable demonstration as being ‘well-known’ in the art,” emphasis added. However, if the Applicants, according to MPEP 2144.03, traverse such an assertion the Examiner should cite a reference in support of his or her position. In short,

the rules of the U.S. Patent and Trademark Office do not allow discretion on the part of the Examiner. Accordingly, Applicants respectfully traverse such rejection and request that either the Examiner must support his assertion with an Affidavit or withdraw the rejection.

Further, Tasman fails to disclose or suggest, at least, “selecting, in response to the assembling, a first set of physical radio transmission resources for the output data stream, wherein the first set of physical radio transmission resources is selected from physical radio transmission resources of one of a plurality of wireless connectivity technologies and belongs to physical radio transmission resources available in a wireless communication device” as recited in claim 1 (emphasis added).

Rather, Tasman discloses that each routing manager produces routing information, control information for the radio layer 10 of the device, and an indication of a correct queuing discipline for a packet. The control information is in the form of a radio profile supplied to a radio layer 10 together with the packet. The radio profile includes transmission parameters for the packet, such as transmission power, frequency, and data rate. The correct queuing discipline is indicated by a type-of-service (TOS) indicator attached to the packet and indicative of the quality of service required by the packet. Thus, the routing managers do not select physical radio transmission resources from a plurality of connectivity technologies available in the device. Rather, the routing managers produce control parameters that define how the physical radio transmission resources of the radio layer are to transmit the packet (Tasman, paragraph [0055]).

Further, Tasman fails to disclose or suggest, at least, “wherein the wireless communication device is provided with the plurality of wireless connectivity technologies” as recited in claim 1 (emphasis added).

Rather, Tasman discloses a single radio device including a plurality of routing managers (Tasman, paragraph [0051]). One of ordinary skill in the art would not have understood routing managers, as disclosed in Tasman, to be wireless connectivity technologies.

Further, Tasman fails to disclose or suggest, at least, “searching for a path that leads from the wireless communication device to one of the at least one destination node and fulfills the service level requirement corresponding to that destination node when one leg of the path is implemented by the first set of physical radio transmission resources, wherein the searching is performed with respect to each of the at least one destination node” as recited in claim 1 (emphasis added).

Rather, Tasman discloses forwarding layer 17 which determines a *next-hop address* for the packet using a destination address to index into the unicast next-hop table associated with forwarding table *t* to retrieve a neighbor table index number (Tasman, Fig. 4, paragraphs [0087]-[0088]). Further, Tasman fails to disclose or suggest a service level requirement being set for the transmission path leading to the destination node. Instead, Tasman discloses the radio profile being used to define the service level for the next hop (*Id.*).

Whereas, in embodiments of the present invention, a path is searched for which

leads from the wireless communication device to one of the at least one destination nodes and fulfills service level requirements corresponding to that destination node, assuming that the first leg of the path is implemented by the first set of physical radio transmission resources already selected for an upcoming transmission of the output data stream. The searching is performed with respect to each destination node, thereby to ensure that if the reserved first set of physical radio transmission resources will actually be used to transmit the output data stream, each data unit of the output stream may be transferred to a respective destination node without violating the service level requirement associated with the data units transmitted to that destination node.

Further, Tasman fails to disclose or suggest, at least, “scheduling a transmission of the output data stream when the path is found for each of the at least one destination node, wherein the scheduling presumes that the transmission is to occur through the first set of physical radio transmission resources” as recited in claim 1 (emphasis added).

Rather, Tasman discloses that each packet is scheduled separately. Furthermore, Tasman discloses that the scheduling is carried out by the type-of-service (TOS) indicator attached to the packet. Only after the scheduling, when the packet is to be transmitted, the radio layer 10 uses the radio profile attached to the packet to select the transmission resources of the mobile station so that the transmission occurs according to the parameters of the radio profile. Thus, in Tasman, the scheduling is not performed for particular physical radio transmission resources previously reserved; rather, each packet reserves all radio transmission

resources of the device according to the parameters of the radio profile.

Hence, Tasman discloses a single mode device including a single connectivity technology. Tasman is unable to optimally utilize its own physical and radio resources, since the routing information and the radio profile are always determined before the packet is supplied to the radio layer 10. Therefore, the selection of radio transmission resources is restricted by the routing information and the radio profile. In fact, Tasman does not even relate to the utilization of physical and radio resources of the mobile station. Rather, Tasman assumes that each packet is forwarded through the radio layer 10 to the correct neighbor with the correct radio profile and under the selected queuing principle (See Tasman, paragraph [0101]). Therefore, Tasman does not offer the non-obvious benefits of the present invention for a multi-mode wireless device including a plurality of wireless connectivity technologies.

Therefore, Applicants respectfully submit that the Office Action fails to establish a *prima facie* case of obviousness with respect to the features recited in claims 1-3 and 5-18 in view of Tasman.

For similar reasons noted above with respect to claim 1, Applicants respectfully submit that the Office Action fails to establish a *prima facie* case of obviousness with respect to the features recited in claims 12 and 15 in view of Tasman.

Claims 2-3 and 5-11 depend from claim 1. Claims 13-14 depend from claim 12. Claims 16-18 depend from claim 15. Accordingly, claims 2-3, 5-11, 13-14, and 16-18

should be allowable for at least their dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the rejections of claims 1-3 and 5-18 under 35 U.S.C. §103(a), and respectfully submit that claims 1, 12, and 15, and the claims that depend therefrom, are now in condition for allowance.

Allowable Subject Matter

The Office Action objected to claims 4 and 19-21 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As previously noted, Applicants respectfully submit that the Office Action failed to establish a *prima facie* case of obviousness with respect to the features recited in claims 1, 12, and 15 in view of Tasman. Claims 4 and 19-21 depend from claims 1, 12, and 15, respectively. Accordingly, claims 4 and 19-21 should be allowable for at least their dependency upon an allowable base claim, and for the specific limitations recited therein.

Therefore, Applicants respectfully request withdrawal of the objections of claims 4 and 19-21, and respectfully submit that claims 1, 12, and 15, and the claims that depend therefrom, are now in condition for allowance.

CONCLUSION

In conclusion, Applicants respectfully submit that the Office Action fails to establish a *prima facie* case of obviousness with respect to the features recited in claims 1-21 in view of Tasman. It is therefore respectfully requested that all of claims 1-21 be allowed, and this present application be passed to issuance.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, Applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



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